

WHAT IS CLAIMED IS:

1. A printing system comprising a detachable gang of printing devices, a pod, a substrate and a positioner, wherein:

the pod comprises a receptacle for reversibly attaching the gang,

the positioner moves the pod relative to the substrate,

each of the printing devices comprises a reservoir containing a different, predetermined agent unique to the reservoir and in fluid connection with the reservoir, a capillary having proximal and distal openings open to ambient pressure and a printing tip comprising the distal opening and which prints the agent on the substrate,

the gang comprises a nozzle surface from which protrudes a plurality of nozzles, each having a proximal and a distal end, wherein the distal end comprises the printing tip, and

the system prints by decelerating the capillaries to move the agent through the bores, out the tips and onto the substrate.

2. A printing system according to claim 1, wherein the nozzle surface has a flatness variation of less than 1 μm .

3. A printing system according to claim 1, wherein the nozzle surface has an internozzle distance variation of less than 1 %.

4. A printing system according to claim 1, wherein the nozzles are spaced to correspond with a predetermined desired array density.

5. A printing system according to claim 1, wherein the nozzles are spaced to correspond with a predetermined desired array density, wherein the density is 9 mm center-to-center.

6. A printing system according to claim 1, wherein the gang is fabricated from a single block of material.

7. A printing system according to claim 1, wherein the gang is made by injection molding, embossing or etching.

8. A printing system according to claim 1, wherein the gang is made of a plastic.

9. A printing system according to claim 1, wherein the gang is made of a plastic selected from the group consisting of polycarbonate, polystyrene, polypropylene and PMMA.

10. A printing system according to claim 1, wherein the gang is made of a glass or ceramic.

11. A printing system according to claim 1, wherein the gang is made of a semiconductor.

12. A printing system according to claim 1, wherein the gang is made of a semiconductor and the semiconductor is silicon.

13. A printing system according to claim 1, wherein the gang is made of metal.

14. A printing system according to claim 1, wherein the gang is made of metal and the metal is stainless steel.

15. A printing system according to claim 1, wherein the agent is a polypeptide or a polynucleotide.

16. A printing system according to claim 1, wherein the agent is a polynucleotide at least 50 nucleotides in length.

17. A printing system according to claim 1, wherein the bore tapers toward the distal opening of the tip.

18. A printing system according to claim 1, wherein the substrate is selected from the group consisting of glass, ceramic, plastic, metal, silicon, acetate and cellulose.

19. A printing system according to claim 1, wherein the substrate provides a

homogeneous surface.

20. A printing system according to claim 1, wherein the substrate provides a surface offering differential surface chemistry or topography.

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21. A printing system according to claim 1, wherein the substrate provides a surface offering differential surface chemistry or topography, which provide predetermined printing sites adapted to receiving, binding, reacting, containing or retaining the agent or liquid.

10 22. A printing system according to claim 1, wherein each printing device further comprises a non-capillary chamber also containing the liquid and having a relatively larger internal diameter than and in fluid connection with the capillary.

15 23. A printing system according to claim 1 further comprising a motion resistor operatively joined to the capillary and providing an incomplete resistance to motion of the capillary along its longitudinal axis, biasing said motion toward the substrate, wherein the resistor is selected from a plurality of springs, an elastomeric membrane and the weight of the capillary.

20 24. A printing system according to claim 1 further comprising a motion resistor operatively joined to the capillary and providing an incomplete resistance to motion of the capillary along its longitudinal axis, biasing said motion toward the substrate, wherein the resistor is the weight of the capillary.

25 25. A printing system according to claim 1 further comprising a register comprising a guide which contacts a registration portion of each printing device, distal to the attachment portion, and moves the tip relative to the substrate.

30 26. A printing system according to claim 1, further comprising a preservation device within, containing or in contact with each printing device, which preserves the capability of the printing device to print the agent on the substrate over long-term storage of the printing

device, wherein the preservation device comprises a deterrent to evaporation of the liquid, wherein the deterrent is selected from the group consisting of a hermetic barrier, a refrigerator, a humidifier and a hygroscopic agent.

27. A printing system according to claim 1, further comprising a preservation device within, containing or in contact with each printing device, which preserves the capability of the printing device to print the agent on the substrate over long-term storage of the printing device, wherein the preservation device comprises a deterrent to evaporation of the liquid, wherein the deterrent is a hermetic barrier.

28. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 1 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

29. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 6 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

30. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 7 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

31. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 8 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

32. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 10 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

33. A method for printing an agent on a substrate comprising the step of printing an agent

with the printing system of claim 11 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

34. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 13 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

35. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 16 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

36. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 19 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

37. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 22 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

38. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 23 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.

39. A method for printing an agent on a substrate comprising the step of printing an agent with the printing system of claim 25 by decelerating the capillary to move the agent through the bore, out the tip and onto the substrate.